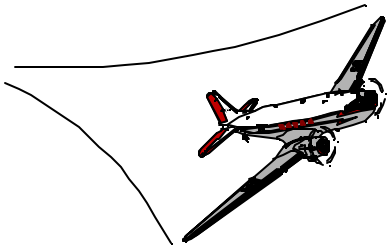
SPECIAL AIRWORTHINESS INFORMATION BULLETIN



U.S. Department of Transportation

Federal Aviation Administration

Aircraft Certification Service
Washington, DC

No. CE-03-48
August 8, 2003

We post SAIBs on the internet at www.airweb.faa.gov

This is information only. Recommendations are not mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts you, an owner or operator of the **SCHEMPP-HIRTH Model Duo Discus T gliders (serial numbers 1 through 78**), that Luftfahrt-Bundesamt (LBA) has issued an Airworthiness Directive (AD) 2003-245/2, dated August 1, 2003. The LBA AD and SCHEMPP-HIRTH technical notes require an immediate inspection of the upper spar cap and the spar web before further flight.

Background

The LBA has reported an in-flight failure of the wing structure at maneuvering loads. Initial analysis indicates failure in the bonding of the wing spar cap and spar web. SCHEMPP-HIRTH has received additional reports of bonding problems of the wing spar cap and spar web. Failure of the bonding, if not detected and corrected, could result in an in-flight separation of the wing from the glider.

Recommendation

We recommend that registered owners of gliders SCHEMPP-HIRTH Model Duo Discus T accomplish the actions of SCHEMPP-HIRTH Flugzeugbau GmbH. Hircheim/Teck Technical Note No. 396-8, No. 890-3, dated August 1, 2003; and SCHEMPP-HIRTH Flugzeugbau GmbH. Hircheim/Teck Appendix to Technical Note No. 396-8 / No. 890-3, dated August 1, 2003. The technical notes are attached.

We are providing this information as a courtesy to owners and operators as we do not issue ADs for gliders that do not have a U.S. type certificate.

For Further Information Contact

Gregory Davidson, Aerospace Engineer, FAA, Small Airplane Directorate, Room 301, 901 Locust, Kansas City, Missouri 64106; telephone: (816) 329-4130; facsimile: (816) 329-4090; email gregory.davison@faa.gov

SCHEMPP-HIRTH Flugzeugbau GmbH, Postfach 1443, 73222 Kircheim/Teck, Federal Republic of Germany; telephone: 49 7021 7298-0; facsimile: 49 7021 7298-199.

1. Removal of the aileron of the main wing
   Do not loosen the Askubal link at the aileron drive and mark it with red colour.

2. Inspection openings for checking the bonding between spar cap and spar web
   a) Cut an inspection opening in the rear web of the wing supporting the aileron see Maintenance Manual diagram 5.
   b) Cut an inspection opening in the outer root rib see page 03.
   c) Cut inspection openings in the lower surface of the starboard wing, see page 04 and 05.
      Remark: As a result of the asymmetric wing connection the spar of the inboard starboard wing is situated more aft as the port wing spar position
   d) Cut inspection openings in the lower surface of the port wing see page 06 and 07.
   e) Cut inspection openings in the airbrake box see page 03, 04 and 06.
   f) Remove the top cover at the inspection opening at the aileron drive.
   g) At the aileron drive, the cut-out for the aileron rod is used as inspection opening.
   h) The pivot bearing in the port root rib is used as inspection opening.

3. Inspection:

   The bonding between the spar cap and the spar web on the upper wing surface has to be checked on the rear side of the spar.
   It is required that the gap between GRFP-spar web and CFRP-spar cap is completely filled with bonding material.

   This can be detected through:
   - excessive bonding resin at the rear upper edge of the spar cap to the spar web connection

   A deficient bonding can be visible on the GRFP-spar web by bright areas (isolated air inclusions).

   A showcase photo on page 8 indicates the following in the area of the break:
   - a complete bonding with excessive bonding resin
   - a defective bonding –white area (air inclusion)

4. Equipment for inspection:

- Endoscope preferable with 90 degree direction
- light

Remark:
If a very long endoscope is available, which enables a safe check of the bonding, fewer inspection openings (see item 2) may be required.

5. Inspection procedure:

The bonding of the upper spar cap to the spar web has to be checked visual **over the whole length** of the main wing through the inspection openings, see item 2.
If an area can not be clearly identified (lighting conditions insufficient) additional inspection openings may be required:
These additional inspection openings should be cut on the connecting line of the inspection openings see item 2c) or on the reference line see item 2d).
At the length of the aileron, additional inspection openings with 12 mm diameter may be cut in the rear web of the wing.

Remark:

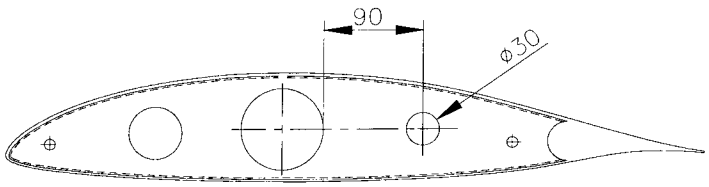
1 a) **Distance of the inspection openings exceeding 500 mm:**
After the check it is sufficient to protect the edge of the foam of the 12 mm inspection openings with resin (sickened with cotton flocks) and to tape over the opening.

1 b) **Distance of the inspection openings less than 500 mm:**
The affected inspection openings have to be closed according the relevant repair instructions.

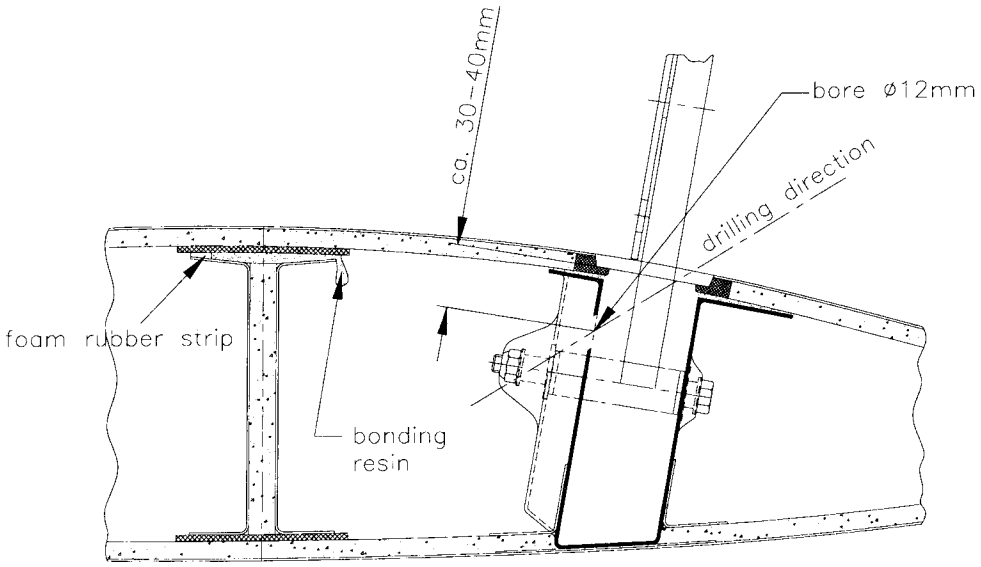
2. In case of doubts during the check regarding the safety of the bonding contact the manufacturer SCHEMPP-HIRTH.

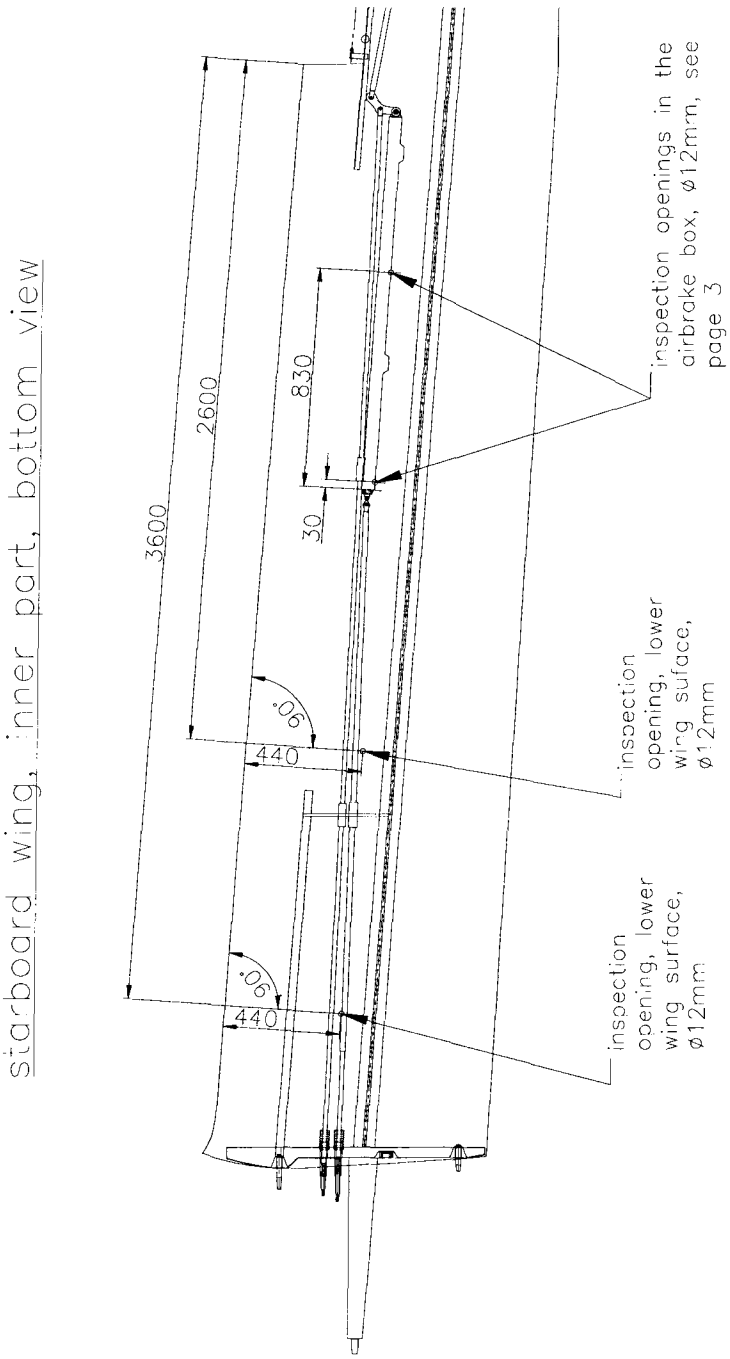
6. Defects in the bonding of the spar cap to spar web connection:
Defects have to be repaired according to working instructions in the appendix of this technical note.

inspection opening in the outer root rib

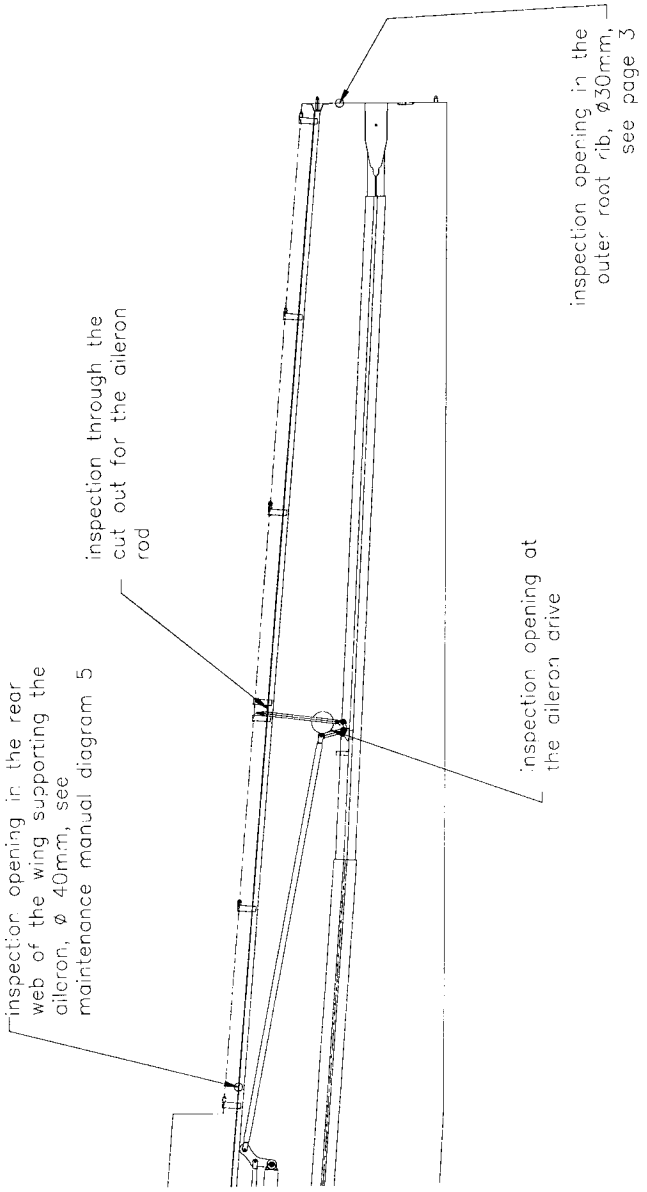


inspection opening in the airbrake box

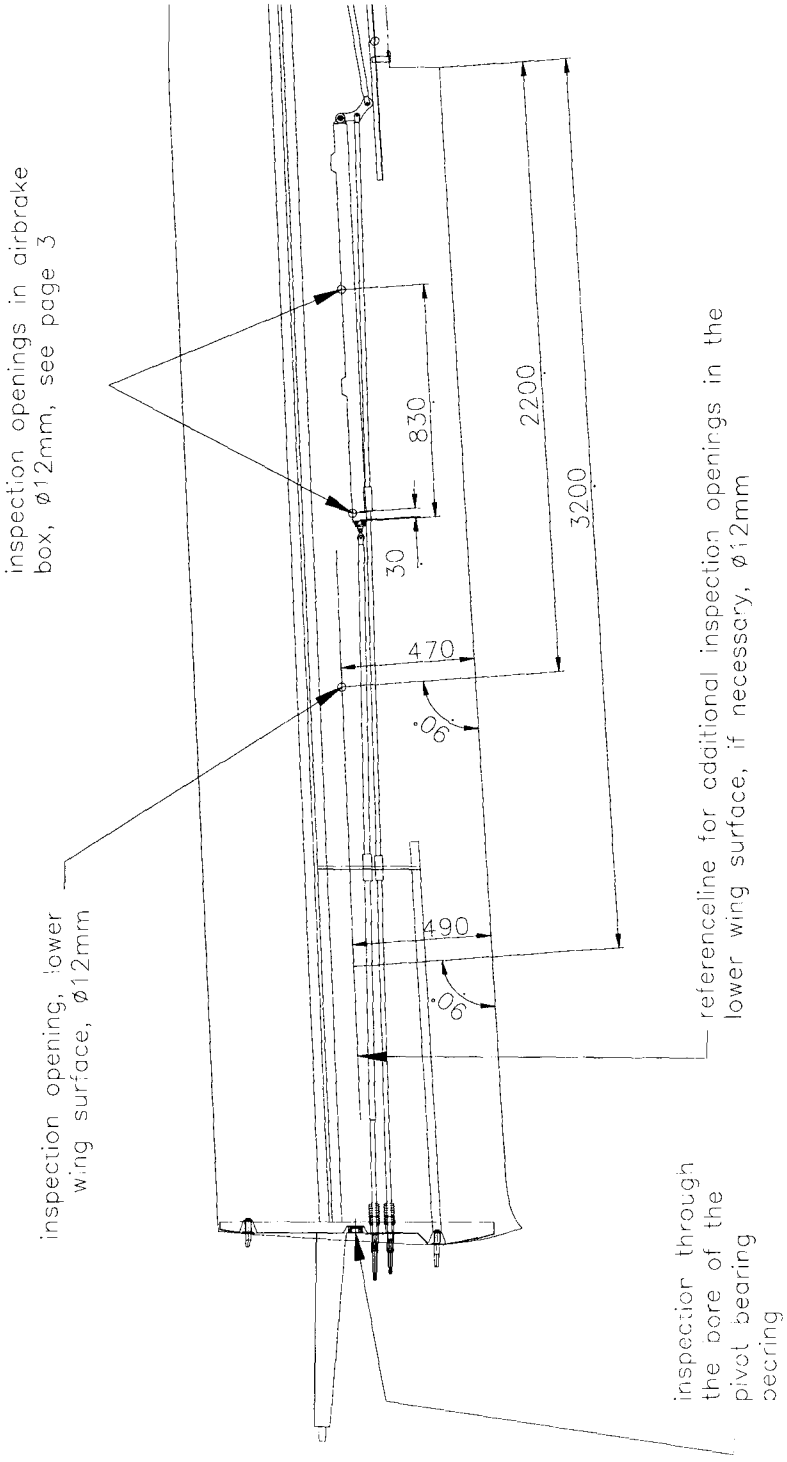



starboard wing, inner part, bottom view
3600
2600
830
30
90°
440
90°
440
inspection openings in the airbrake box, ø12mm, see page 3
inspection opening, lower wing surface, ø12mm
inspection opening, lower wing surface, ø12mm

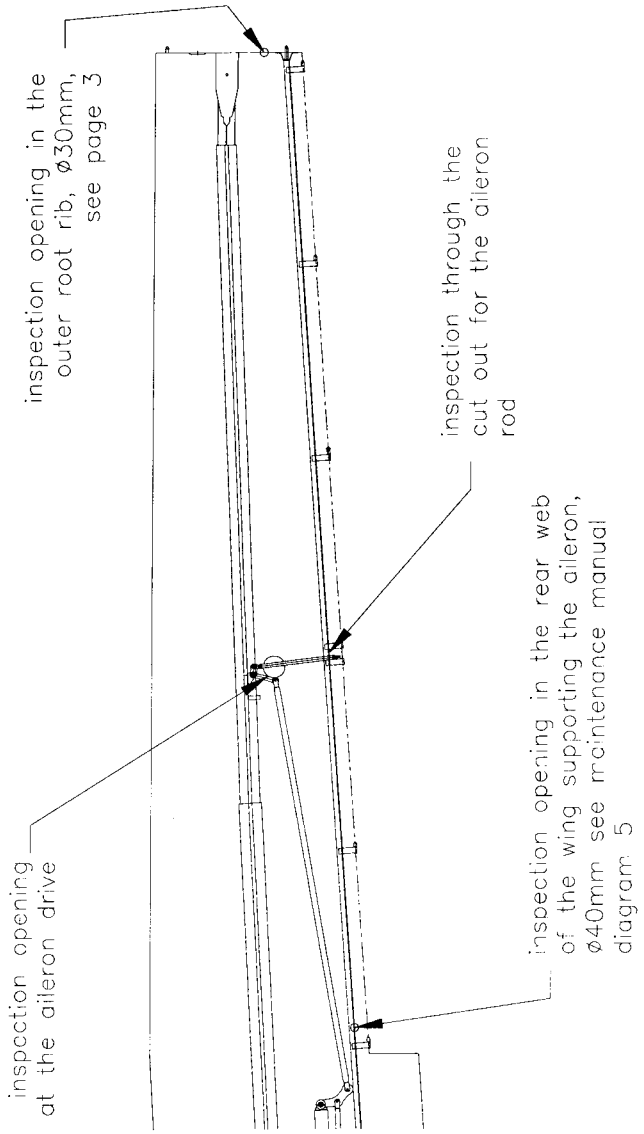
starboard wing, outer part, bottom view

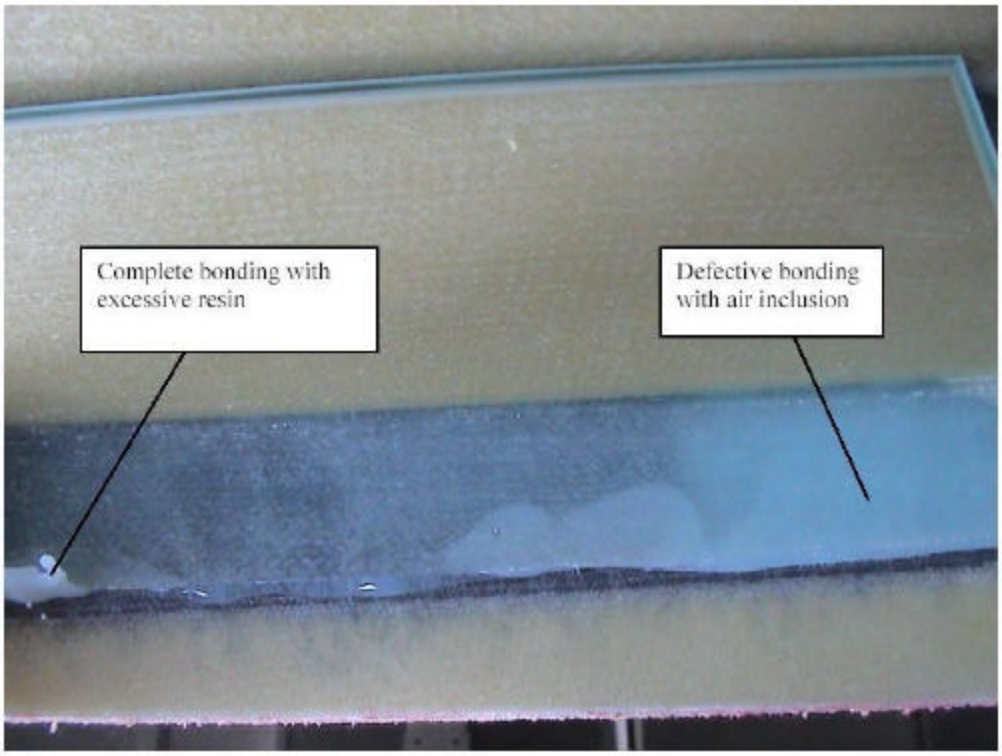


port wing, inner part, bottom view



port wing, outer part, bottom view




Complete bonding with excessive resin
Defective bonding with air inclusion

Repair instructions for the spar cap/spar web connection

A cross section of the wing with spar is shown on page 03.

To repair the spar cap/spar web connection the opening in the lower surface has to be increased accordingly so that the repair can be done.

Take care that the opening has a distance of more than 20 mm to the spar cap.

I. Deficiency in the bonding of less than 15 mm from the edge of the web

1. Roughen the surface in the gap of spar cap and spar web.
2. Around the affected area roughen the surface of spar web and the wing shell.
3. Fill the gap with resin (thickened with cotton flocks)
4. Additional apply a layer of glasfibre 92125 under 45 degrees over the affected area. This layer should exceed the border of this aerea at least 20 mm covering the edge of the spar cap and spar web.

II. Deficiency in the bonding of more than 15 mm from the edge of the web or within the flange of the spar web

1. In the area of the deficiency sand the spar web away and scarf the edge.
2. After roughening of the spar cap and the surrounding spar web apply the following layers 92125 under 45 degrees over the area to be repaired:

wing station	**numbers of layers 92125 under 45 degrees**
from root rib inboard until 1100 mm	6
from 1100 mm root rib inboard until 3000 mm	4
from 3000 mm root rib inboard until root rib outboard	3

Remark: The minimum scarf length for **one layer 92125 is at least 10 mm.**

III. General instructions to the repair of the spar cap/spar web connection and the repair of the repair openings in the wing shell

The repair of the spar cap/spar web connection and the repair of the repair openings in the wing shell must be done according following additional instructions:

a) Repair instructions in the appendix of the Maintenance Manuals:

- Repair Instructions Duo Discus, issue January 1994
- Repair Instructions Duo Discus T, issue June 2000

b) Repair instructions for sailplanes and powered sailplanes constructed from fibre reinforced plastic (FRP), issue September 1991

SCHEMPP-HIRTH Flugzeugbau GmbH. Kirchheim/Teck	Technical Note No. 396 - 8 No. 890 - 3	Page: 01 No. of pages.: 02

SUBJECT: Wing,
bonding of spar cap to spar web

AFFECTED: Sailplane Duo Discus (TC-No.: 396)
S/N 165 through 389

Sailplane Duo Discus C (Czech TC-No.: 98-02)
S/N 170CS, 300CS and 350CS

Powered sailplane Duo Discus T (TC-No. 890)
S/N 1 through 78

URGENCY: Before next flight!

REASON: The left outer wingpart of a sailplane Duo Discus had an in-flight failure 4 m inboard of the wing tip.
At the broken section a failure in the bonding of the spar cap and the spar web could be identified.
The flight loads causing the break are not known.
For safety reasons all SHVL wings will be checked.

ACTIONS:

1. The bonding between the upper spar cap and the spar web are to be checked according to the instructions in the appendix of this Technical Note.

2. Defects in the spar cap and spar web bonding are to be repaired according to the instructions in the appendix of this Technical Note.

3. After completion of the check or respective repair the ailerons are to be re-installed and the aileron deflections are to be controlled.

4. For information only the report of an executed repair should be sent to:

   Schempp-Hirth
   Flugzeugbau GmbH.
   Postfach 1443
   73222 Kirchheim/Teck

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MATERIAL: See repair instructions in the appendix of this Technical Note.

WEIGHT: Alteration negligible

C/G POSITION: Alteration negligible

REMARK: **The actions must be accomplished by a certified repair station and entered in the log book.**

Kirchheim/Teck, July 31, 2003

Issued: ..... (H. Treiber)

LBA-approved:

The German original of this Technical Note has been approved by the LBA under the date of ..... August, 1st ..... 2003 ..... and is signed by Mr. ..... Blume .....
The translation into English has been done by best knowledge and judgement.